PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ian Zetterstrom Smith

Serial No.: 10/699,974

Filed: November 3, 2003

Title: TRIMMER

Docket No.: 36246

LETTER

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Enclosed is a certified copy of UK Patent Application No. 0225685.7; the priority of which has been claimed in the above-identified application.

Respectfully submitted,

PEARNE & GORDON LLP

By: _____
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November 19, 2003

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Jeffrey J. Sopko
Name of Attorney for Applicant(s)

November 19, 2003
Date

_____
Signature of Attorney

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

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Signed R. Mahoney

Dated 4 November 2003

Pa[illegible]s Form 1/77

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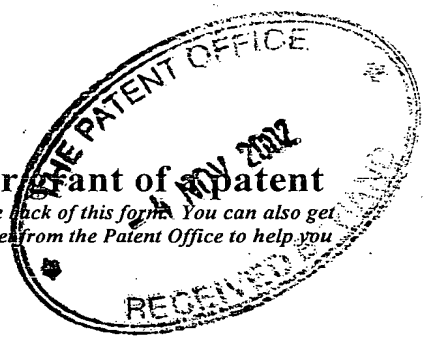

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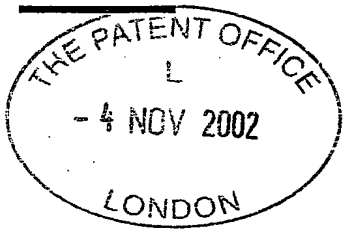

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P01/7700 0.00-0225685.7

1/77

- 4 NOV 2002

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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

1. Your reference P508588GB

2. Patent application number *(The Patent Office will fill in this part)* 0225685.7

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

Electrolux Outdoor Products Limited
Preston Road
Aycliffe Industrial Park
Newton Aycliffe
County Durham
DL5 6UP
United Kingdom

Patents ADP number *(if you know it)* 6368468001

If the applicant is a corporate body, give the country/state of its incorporation: United Kingdom

4. Title of the invention: Trimmer

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

WITHERS & ROGERS
Goldings House
2 Hays Lane
London
SE1 2HW

Patents ADP number *(if you know it)* 1776001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(answer 'Yes' if:*
a) any applicant named in part 3 is not an inventor, or
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9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form	
Description	5
Claim(s)	1
Abstract	1 DMP
Drawing (s)	5 + 5

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Priority documents	
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Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	1
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Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Withers & Rogers — Signature — Date 4 November 2002

Withers & Rogers

12. Name and daytime telephone number of person to contact in the United Kingdom — David M Pratt — 020 7663 3500

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P508588GB

Trimmer

This invention relates to a grass trimming device which is capable of being switched between at least two alternative configurations which are suitable for grass trimming and edge trimming respectively.

A known grass trimming device (trimmer) comprises a cutting head mounted at one end of a shaft, an operator handle being positioned at the other end of the shaft. The cutting head includes a cutter constituted by a rotatable blade or a rotatable flexible cutting line. The cutting head can be moved relative to the shaft, to position the cutter generally horizontal for grass trimming and generally vertical for edge trimming. A small diameter wheel or roller, typically rotatably mounted in (or hanging from) the housing of the cutting head, may be provided for rolling the trimmer along a lawn edge when the trimmer is in the edging mode. Unfortunately, the wheels or rollers of known trimmers are so small that negotiation of uneven lawn surfaces or riding over obstacles such as twigs and stones is difficult, particularly if the user employs single-handed control of the trimmer. A trimmer of this type can be operated using two hands, though difficulties can still arise in negotiating uneven lawn surfaces. Thus, although two-handed operation of such a trimmer is easier than one-handed operation - partly because it is easier to push the trimmer using two hands, and partly because one hand can be used to lift the "front" of the trimmer whilst the other hand is used to push the trimmer - it is still difficult to control the movement of the trimmer sufficiently accurately to ensure a good edging performance.

Known trimmers are relatively easy to operate when in the trimming configuration. However, when in the edging configuration, the user must stand at right-angles to the edge of a lawn being trimmed, and move sideways along that edge as trimming progresses. This is disadvantageous, in that it is difficult to align the cutter accurately with the edge of the lawn (owing to the eye of the user not being in alignment with the lawn edge), and this can lead to a poor edging performance. This poor edging

performance is exacerbated by difficulties caused by negotiation of uneven lawn surfaces or riding over obstacles.

The aim of the invention is to provide a trimmer having improved edging capabilities.

The present invention provides a trimmer comprising a cutting head housing a cutter means, a shaft for supporting the cutting head, roller means rotatably mounted with respect to the cutting head, and drive means for driving the cutter means, the cutting head being connected to the shaft by connection means permitting the cutting head to be positioned with its cutter means either substantially horizontal or substantially vertical, the roller means being sized to contact the ground when the cutter means is substantially vertical and to circumscribe the axis of the drive means, the arrangement being such that the cutter means extends beyond the circumference of the roller means.

Advantageously, the roller means is a wheel.

Advantageously, the drive means comprises a motor and a drive shaft, the drive shaft passing through the roller means.

Preferably, the cutter means is rotatable, and the drive engagement between the motor and the cutter means is a rotatable drive engagement. The motor may be an electric motor.

In a preferred embodiment, a rotatable cutter line constitutes the cutter means.

Advantageously, the axis of rotation of the roller means is substantially coincident with the axis of rotation of the cutter means. Advantageously, the radius of the roller means is of the order of, but slightly less than, the effective radius of the cutter means.

A trimmer constructed in accordance with the invention will now be described, by way of example, with reference to the drawings, in which:-

Figure 1 is perspective view of the cutting head of the trimmer;

Figure 2 is a side elevation of the trimmer in edging mode;

Figure 3 is a front elevation of the trimmer in edging mode;

Figure 4 is a side elevation of the trimmer in trimming mode; and

Figure 5 is a front elevation of the trimmer in trimming mode.

As shown in the drawings, the trimmer comprises a cutting head 1 which is connected to a shaft 2 by means of a ball-and-socket joint 3. The joint 3 is constituted by a housing 3a, which is integrally formed with the shaft 2, and a ball 3b which is fixed to the cutting head 1. The housing 3a defines a generally spherical socket which complements the shape of the ball 3b. The shaft 2 and the housing 3a are made of a plastics material such as ABS or polypropylene, and the ball 3b is made of a plastics material such as ABS or polypropylene. The cutting head 1 includes a rotatable hub 4 which houses a coiled up flexible cutter line (only the free end of portion 5 of which can be seen in the drawings). The cutter line 5 exits the hub 4 via an aperture 4a, and can be fed out (in known manner) as the cutter line wears. The axis A of rotation of the joint 3 (see Figure 4) lies at an angle of substantially 45° to the plane of rotation of the cutter line 5.

The cutting head 1 is also provided with a guard 6 made of a plastics material such as ABS or polypropylene. The guard 6 partially surrounds the hub 4 and the cutter line 5 in such a manner that the cutter line has an effective cutting range which extends somewhat less than 180°. The hub 4 is rotatably driven by an electric motor (only the output shaft 7 of which can be seen), the motor being housed within the ball 3b. A wheel 8 made of a plastics material such as ABS or polypropylene is mounted between the guard 6 and the housing 3a, the wheel being rotatable relative to the guard about the axis of the motor shaft 7, and having a radius that is slightly less than the effective radius of the cutter line 5. A hand grip 9 is provided at the free (upper) end of the handle 2.

Figures 2 and 3 show the trimmer 1 in the edging position, that is to say with the cutting head 1 positioned so that the cutter line 5 is generally vertical. In this position, as shown in Figure 2, the rim of the wheel 8 can be positioned on a lawn adjacent to the

edge thereof, so that the cutter line 5 is positioned for an edging operation. The trimmer can then be advanced along the edge of the lawn to carry out the edging operation. As shown in Figure 2, the distance between the effective radius of the cutter line 5 and the radius of the wheel 8 defines the depth of cut (cutting swathe) which can be effected with the trimmer in the edging position. In Figure 2, arrow B indicates the edging direction (that is to say the direction in which the trimmer is moved during edging), arrow C indicates the cutting direction (that is to say the direction of rotation of the cutter line 5), and double-headed arrow D indicates the depth of cut (the cutting swathe) of the cutter line 5.

In order to change the trimmer from its edging mode to its trimming mode, it is necessary only to rotate the cutting head 1 relative to the shaft 2, through either 120° in one direction, or 240° in the other direction. Figures 4 and 5 show the trimmer with the cutting head 1 in the trimming position, that is to say with the cutter line 5 generally horizontal.

One advantage of the 120° or 240° rotational angle necessary to convert between the two modes is that, in the edging mode, the shaft 2 is generally aligned with the edge of the lawn, so that the user can carry out an edging operation when positioned behind the cutting head 1 and moving forwards (or backwards) along the edge of the lawn. This enables the user to line up the cutter line 5 with the edge of the lawn, because the user's eye can be positioned substantially in the plane of the lawn edge. This is to be contrasted with known trimmers, in which the user faces the edge of the lawn when the trimmer is in the edging position, and has to move sideways parallel to the lawn edge to carry out an edging operation. Clearly, in this position, the user cannot line up the cutter line accurately with the lawn edge. A further advantage of the trimmer described above is that, with the trimmer in the edging configuration as shown in Figure 2, the direction of rotation of the cutter line 5 is such as to throw cut grass and debris directly away from the user, that is to say at 180° to the user. This is because the user is positioned "behind" the cutting head. This is to be contrasted with known trimmer/edgers, in which the user stands at substantially 90° to the edge of the lawn (and hence to the plane of rotation of the cutter). Accordingly, there is less chance of

the user of the trimmer of the present invention being hit by flying debris than with known devices.

An advantage of this trimmer is that the wheel 8 has a relatively large diameter. The trimmer can, therefore, handle uneven lawn surfaces rather better than known wheeled trimmers which typically have a small wheel hanging off the front of the cutting head. This is particularly the case where the trimmer is operated using only one hand. Thus, because of the large diameter wheel, the trimmer described above can be operated using only one hand, whilst negotiating uneven lawn surfaces and ensuring an accurate edging action.

Another advantage of the trimmer described above is that the joint about which the cutting head 1 rotates is low down, thereby reducing the difference in the height of the hand grip 9 when the trimmer is in the edging and trimming modes.

Claims

1. A trimmer comprising a cutting head housing a cutter means, a shaft for supporting the cutting head, roller means rotatably mounted with respect to the cutting head, and drive means for driving the cutter means, the cutting head being connected to the shaft by connection means permitting the cutting head to be positioned with its cutter means either substantially horizontal or substantially vertical, the roller means being sized to contact the ground when the cutter means is substantially vertical and to circumscribe the axis of the drive means, the arrangement being such that the cutter means extends beyond the circumference of the roller means.

2. A trimmer as claimed in claim 1, wherein the roller means is a wheel.

3. A trimmer as claimed in claim 1 or claim 2, wherein the drive means comprises a motor and a drive shaft, the drive shaft passing through the roller means.

4. A trimmer as claimed in claim 3, wherein the cutter means is rotatable, and the drive engagement between the motor and the cutter means is a rotatable drive engagement.

5. A trimmer as claimed in claim 3 or claim 4, wherein the motor is an electric motor.

6. A trimmer as claimed in any one of claims 1 to 5, wherein a rotatable cutter line constitutes the cutter means.

7. A trimmer as claimed in any one of claims 1 to 6, wherein the axis of rotation of the roller means is substantially coincident with the axis of rotation of the cutter means.

8. A trimmer as claimed in claim 7, wherein the radius of the roller means is of the order of, but slightly less than, the effective radius of the cutter means.

Trimmer

Abstract

A trimmer comprises a cutting head (1) housing a cutter (5), and a shaft (2) for supporting the cutting head. A large diameter wheel (8) is rotatably mounted with respect to the cutting head (1), and a motor is provided for driving the cutter (5) via drive means (7). The cutting head (1) is connected to the shaft (2) by connection means permitting the cutting head to be positioned with its cutter (5) either substantially horizontal or substantially vertical. The wheel (8) is sized to contact the ground when the cutter (5) is substantially vertical and to circumscribe the axis of the drive means (7). The arrangement is such that the cutter (5) extends beyond the circumference of the wheel (8).

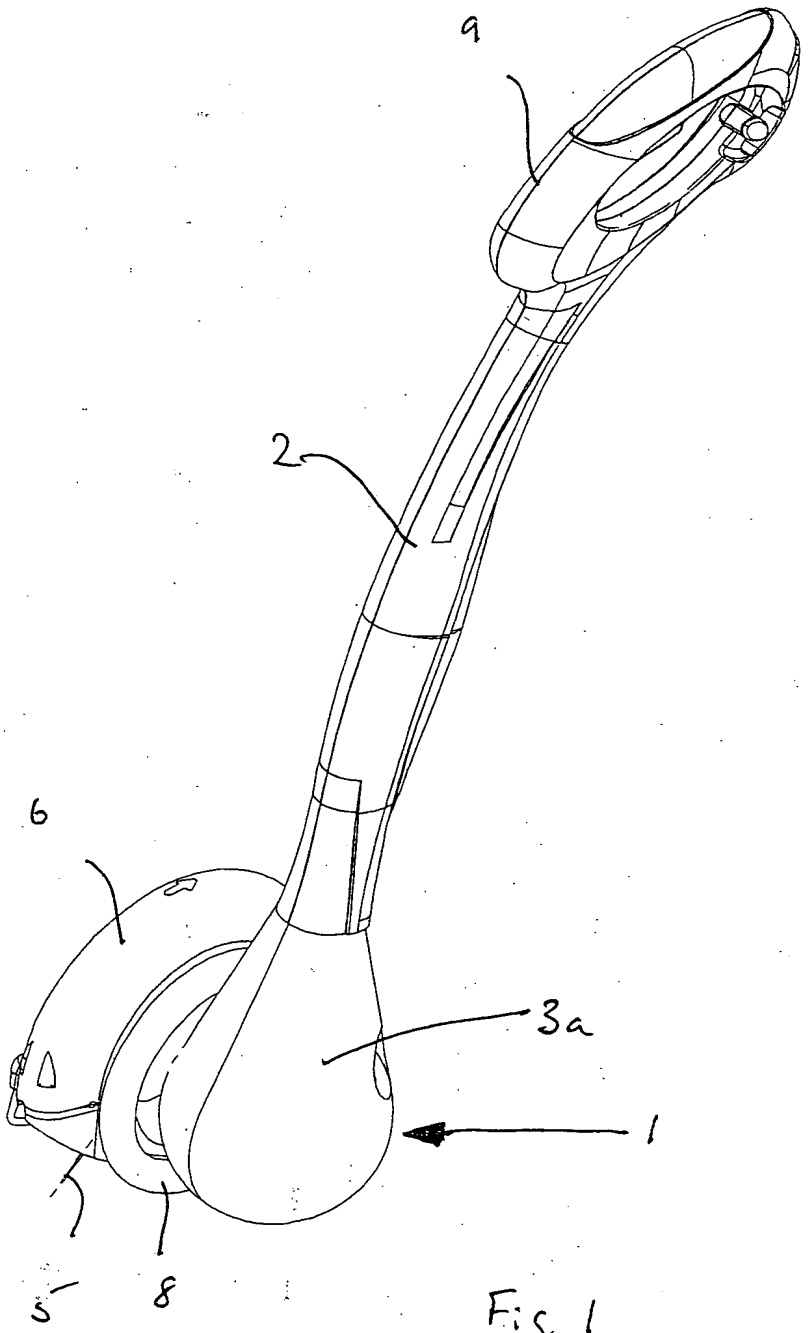

Fig. 1

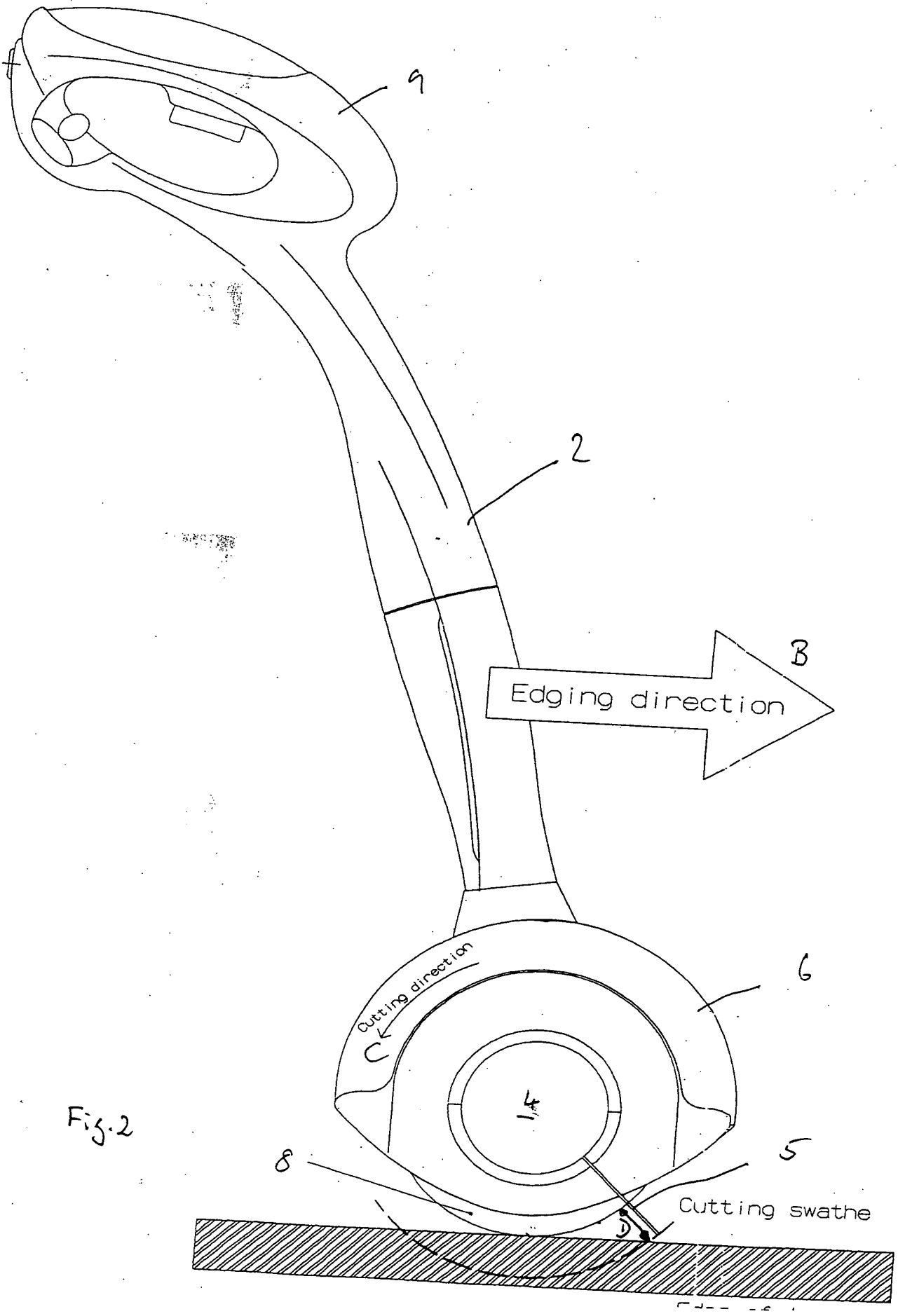
9
2
B
Edging direction
Cutting direction
C
6
4
8
5
Cutting swathe
D

Fig.2

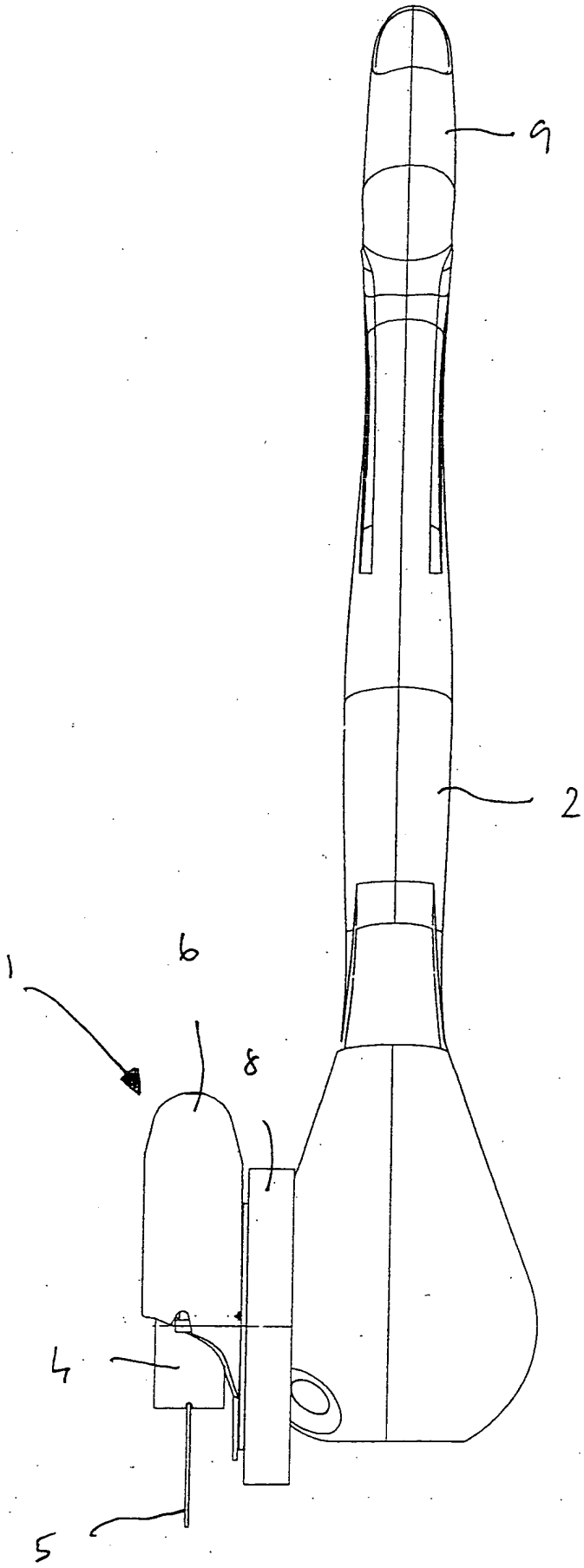

Fig. 3

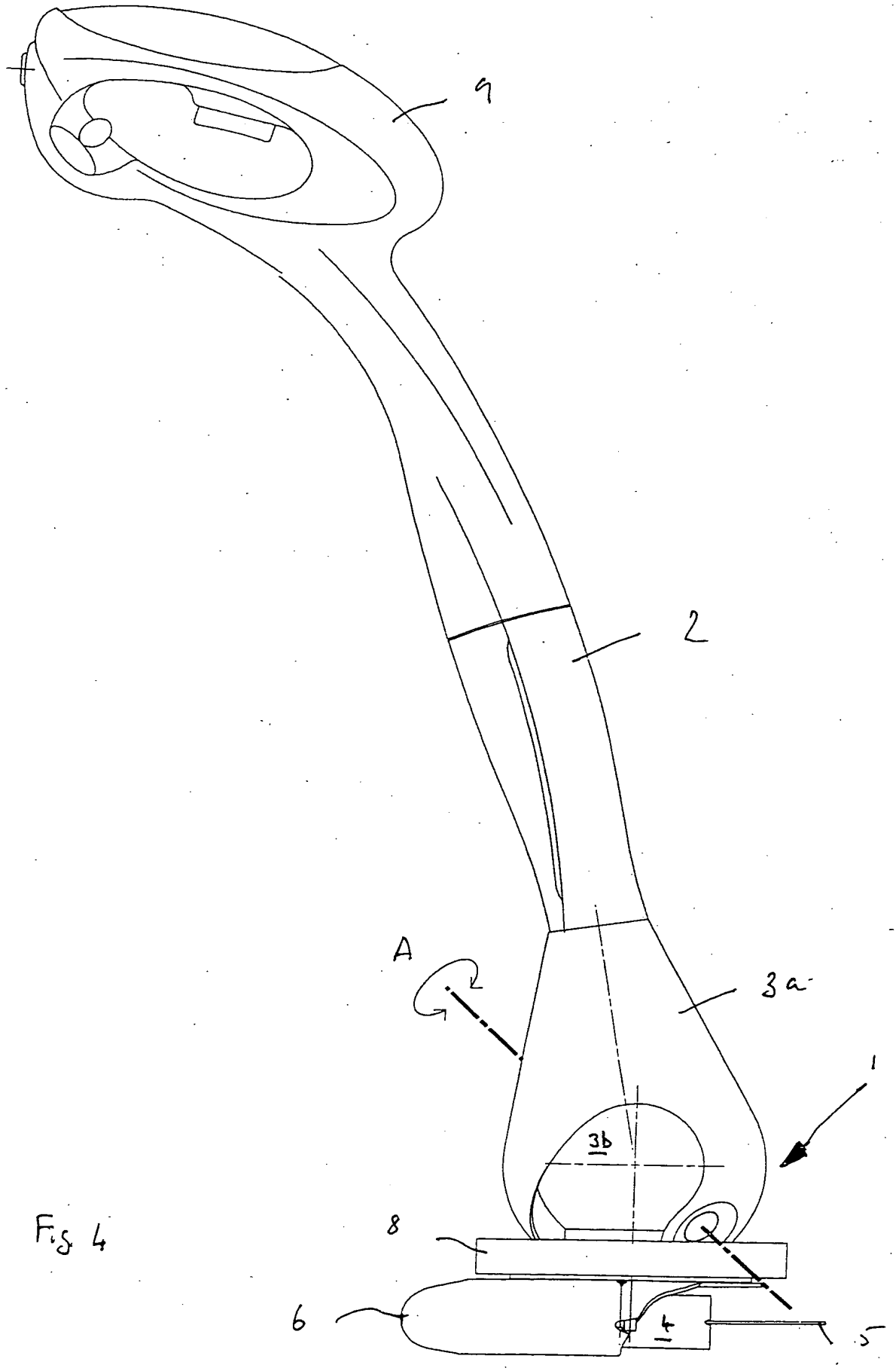

Fig 4

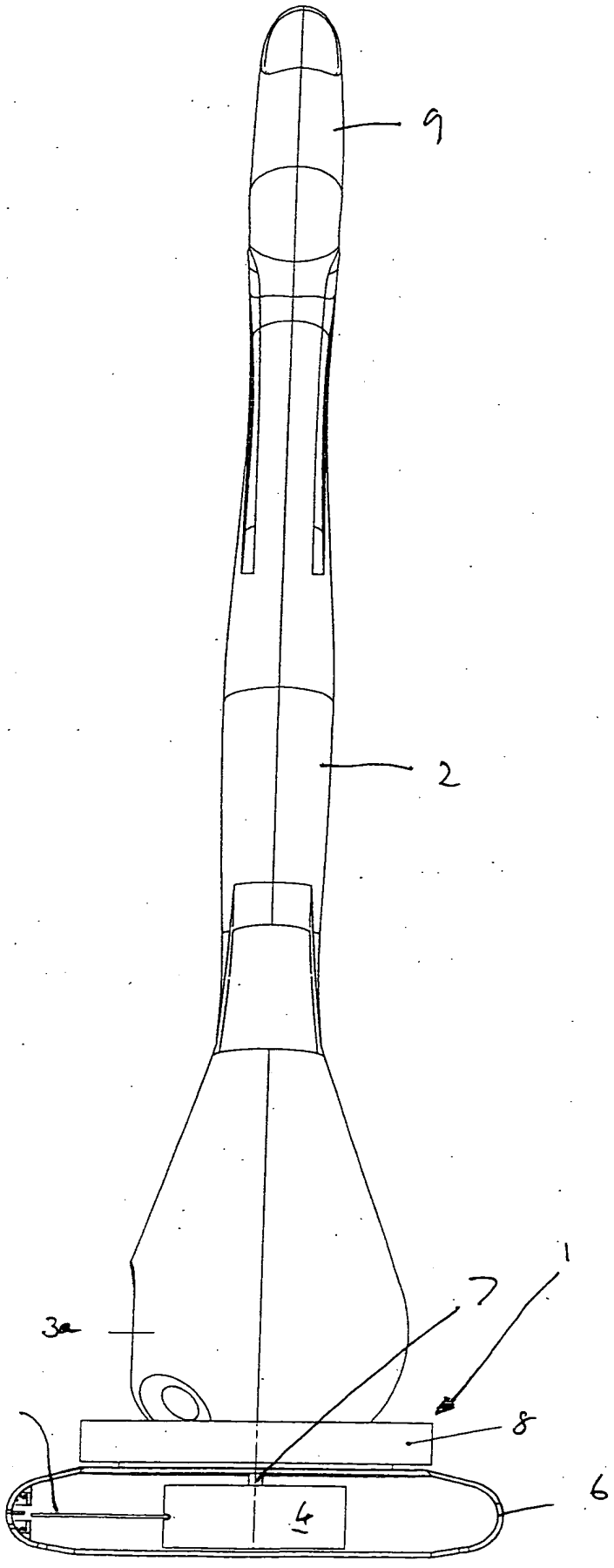

Fig. 5

WHR 36246